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TESTS IN SILENT READING IN THE RURAL SCHOOLS OF SANTA CLARA COUNTY, CALIFORNIA

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The main purpose of silent reading is, of course, to get the thought from the printed page. This ability forms the basis of all profitable study of books. To test this ability is one of the leading educational problems of the day. In the past, we have relied largely upon opinions, and, needless to say, these have been of small scientific value. It is true also that a large part of the reading itself has no scientific basis, and consequently the results therefrom have been meager. This may be partly accounted for by a lack of adequate means of measuring the efficiency of instruction in determining what results were being secured in the schools. It is the purpose of this study to discover how the rural schools compare with city schools where similar tests have been made, and with the standardized results.

The tests used in this study are known as the Starch Reading Tests.[1] They consist of simple prose stories, each printed on a separate sheet of paper (different grades receiving different stories). The children were asked to read silently, with as much speed and as great care as possible. They were told that they would be asked to write as much of the story as they had read, and that they would be marked upon the thought reproduced as well as upon the number of words read during a certain length of time. The tests were all given by the writer, who varied from the usual method of giving these tests. Instead of giving to each grade the test that bore the same number as the grade, and therefore giving a different test to each grade, he gave test No. 3 to the third and fourth grades, No. 5. to the fifth and sixth grades, and No. 7 to the seventh and eighth grades. This showed the advance of the pupils of the higher grade over the pupils in the grade just below. In other words, it showed the advance of the fourth grade above the third, the sixth above the fifth, and the eighth above the seventh. To show the advance of the fifth-grade pupils above the pupils in the fourth grade, the latter were given test No. 5 also; and to show the advance of the seventh grade above the sixth grade, pupils of the latter were also given test No. 7. Thus the fourth and sixth grades were given two tests each. To illustrate, it can be shown as follows:

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[1] Daniel Starch, "Measurement of Efficiency in Reading," *Journal of Educational Psychology*, January, 1915.

$$\begin{array}{lccc} \text{No. of test} \ldots\ldots\ldots\ldots & 3 & 5 & 7 \\ \text{Grades} \ldots\ldots\ldots\ldots\ldots & \overbrace{3\text{–}4} & \overbrace{5\text{–}6} & \overbrace{7\text{–}8} \\ \text{No of test} \ldots\ldots\ldots\ldots & & 5 & 7 \end{array}$$

By giving the fourth and sixth grades the extra tests above mentioned, it completed the chain and showed the progress the pupils had made from grade to grade and from year to year.

The blanks on which the stories were printed were distributed to the pupils with the blank sides up so that no one could read any of the material until all were ready. After a few moments for explanation and allowance for temporary nervousness of the children to disappear, the signals "Turn" and "Read" were given. The pupils were allowed exactly thirty seconds. Then they marked the last word read, turned the blanks immediately and wrote on the back all that they remembered having read. They were allowed as much time as they needed, but were not allowed to turn the blank over to see the test. Finally they turned the blanks again and filled out the spaces at the bottom, after which the papers were collected.

The speed of reading was determined by ascertaining the number of words read per second. This was done by having a blank on which was indicated the number of words in each line. With this blank the total number of words read was determined very quickly. Dividing by 30 gave the speed of reading per second.

The child's ability to comprehend what he read was measured by the number of ideas he was able to reproduce correctly. These ideas were arbitrarily weighted in terms of the combined judgments of university faculty men as follows:

Story No. 3

Value
9. Abe hurried home as fast as he could.
4. Did not wear stockings and shoes like you.
3. Or he could have run faster.
5. He wore deer skin leggings and moccasins of bearskin.
3. His mother made them for him.
4. He hurried across rough fields.
7. He was a funny looking figure hurrying along.
3. His suit was made of homespun cloth.
5. His cap was made of coonskin.
4. Tail of coonskin behind him like a funny tassel.
6. He had honest twinkling blue eyes.
4. This lad of long ago would have liked.
6. In one hand he held something very precious.
9. It was only a book, but Abe loved it very much.
6. Loved it more than gold or precious stones.

Story No. 5

2. Once upon a time.
7. There lived a very rich man.
4. He was also a king.
4. His name was Midas.
7. He had a little daughter.
2. Whom nobody but myself ever heard of.
2. I either never knew her name or have forgotten.
5. I choose to call her Marygold.
9. Midas was fonder of gold than anything else.
5. Valued crown chiefly for its precious metal.
7. If he loved anything better it was Marygold.
3. Or half as well.
4. Played merrily around her father's footstool.
6. The more love for daughter, the more gold.
9. He thought, foolish man, that the best thing that he could possibly do for his dear child would be to give her the immensest pile of yellow, glittering coin that had ever been scraped together since the world was made.
7. He gave all his thoughts to this one purpose.

Story No. 7

8. Captain John Hull was mint-master of Massachusetts.
6. He coined all the money that was made there.
4. This was a new line of business.
3. In earlier days of the colony.

5. Currency coinage consisted of gold and silver.
4. Money of England, Portugal, and Spain.
9. { 4. Coins were scarce and people were forced to
  5. barter their commodities or belongings.
7. Not enough money in parts of country to pay ministers.
5. Ministers forced to take quantities of fish, bushels of corn for gold and silver.
5. Perhaps exchanged a bearskin for a coat.
5. A barrel of molasses for a pile of pine boards.
4. Musket bullets instead of farthings. . . . .
4. Indians had a kind of money called wampum.
5. Wampum was made of clam-shells.
5. This specie was taken for debts by English.
4. Bank bills had never been heard of . . . .
5. Not enough money to pay ministers.

No child was expected to read the whole story in the time allowed, nor was any one expected to reproduce all the thought read. As shown by Tables I and II, there is a great range of variation, both in the number of words read per second and also in the reproduction of the thought.

The tests were given to all the grades except the first and second. The tests were given in twenty-six rural schools. Of the schools tested, eight were one-teacher schools, seven were two-teacher, seven were three-teacher, and four had three or more teachers. Over nine hundred children in all were given the tests. The schools were selected from different parts of the county, so that they were fairly representative.

RESULTS OF THE TESTS

The results of the tests are shown in the accompanying tables and graphs. Table I shows the number of words read per second, the median read, the standard, the median for the city of San Jose, California, and also the progress from grade to grade. By examining the table, it will be seen that the number of words read per second varies greatly in the same grade. I wish to call attention to the sixth grade, which was given test No. 7. The number of words range from 0 to 8 per second. In the eighth grade, given test No. 7, it ranges from 1 to 8½. The smallest range is found in the fifth grade, where it varies from 1 to 5 words per second.

TABLE I

NUMBER OF WORDS READ PER SECOND, THE MEDIAN, THE STANDARD, AND SAN JOSE STANDARD

Number of Papers	GRADE	No. of Test	0	.5	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	8.5	Median	Standard	San Jose Standard
102	VIII	7	....	....	4	2	6	16	8	20	18	6	6	2	2	4	2	....	2	4	3.4	4.0	3.32
162	VII	7	....	....	....	4	30	28	6	36	16	8	10	2	2	10	6	2	....	2	3.7	3.6	2.7
148	VI	7	4	....	....	10	18	30	36	22	4	6	4	4	2	4	....	2	2	....	2.7	......	....
140	VI	5	....	1	3	16	42	16	8	24	8	12	1	1	....	4	....	....	....	....	3.1	......	....
168	V	5	....	....	18	22	62	30	29	2	8	4	2	....	....	....	....	....	....	....	1.9	2.8	2.1
168	IV	5	4	3	20	20	68	29	17	1	3	2	....	....	1	....	....	....	....	....	1.7	......	....
198	IV	3	2	....	16	36	52	42	22	10	14	....	2	2	....	....	....	....	....	....	1.8	......	1.8
166	III	3	4	8	40	30	40	22	10	6	4	....	....	....	....	2	....	....	....	....	1.5	2.1	1.5

TABLE II

SHOWING DISTRIBUTION OF POINTS READ, NUMBER REPRODUCED, AND THE MEDIAN

Number of Papers	Grade	No. of Test	0	5	10	15	20	25	30	35	40	45	Median	San Jose
106	VIII	7	2	4	26	32	22	12	4	....	4	....	13	19.2
162	VII	7	4	2	16	40	26	44	18	8	4	....	19	18.5
140	VI	7	6	6	40	48	24	12	....	2	2	....	12	......
156	VI	5	4	....	8	20	26	52	38	6	6	....	22	......
169	V	5	3	10	20	41	16	50	21	4	4	....	19	26.0
174	IV	5	2	2	26	38	52	48	4	....	2	....	17	......
192	IV	3	22	8	44	50	68	....	....	....	....	....	13	15.0
168	III	3	30	22	62	40	10	2	2	....	....	....	7.5	12.5

In comparing the median number of words read per second in the rural schools with the medians for San Jose schools, it will be seen that the rural schools compare very favorably with city schools. The fifth grade falls $\frac{2}{10}$ below, while the seventh and eighth grades score higher than the city schools of that community. But if we make a comparison of both the rural schools of Santa Clara County and the city schools of San Jose with the standardized scores, we find that both fall below, with the single exception of the seventh grade in the rural schools, which surpasses the standard by $\frac{1}{10}$.

Table II shows the distribution of the ideas reproduced, the median, and the median number reproduced in the city of San Jose, California. In the reproduction of the thought, the rural-school children fall below the children of the city of San Jose. There is a very marked difference in the third grade, where the median for the rural schools is 7.5, as against 12.5 in the city. This is not surprising, though, when we note that 30 children out of 168, or nearly 20 per cent, reproduced nothing of what they had read. It will be noted further that 22 children out of 192 in the fourth grade, reading the same story, reproduced nothing of what they had read. An examination of the medians shows that there is a great fluctuation from grade to grade; especially is this true between the sixth, seventh, and eighth grades. All three of these grades were given test No. 7. The sixth-grade median is 12. It rises to 19 in the seventh grade and falls to 13 in the eighth grade.

The range of ability in reproduction is very great. Every grade contains pupils who score 0 in reproduction, while, on the other hand, every grade, except the third and fourth, have pupils who score as high as 40 points.

The variation in the median attained by the pupils of San Jose and those of the rural schools may be accounted for, in part at least, by the fact that the tests were given and the papers scored by different examiners. But, to show that there is a fairly good correlation between the two sets of scores, the writer scored several hundred papers of the San Jose children, and the graphs show the correlations. In working out the percentage of correlation by the "Spearmann Foot Rule," it is shown that the correlation for the seventh grade is 87.5 per cent and for the eighth grade, 91.2

TABLE III

Showing Number of Words Read per Second by Different Schools

No. of Papers	No. of Depart-ments	0	.5	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	8.5	Median
464	more than III	4	2	14	44	98	102	56	64	26	18	14	4	4	8	4	4	2	2	2.2
252	III	2	1	11	24	60	30	32	26	24	10	2	6	2	16	2	.....	2	2	2.5
360	II	2	12	36	28	100	62	40	34	14	14	8	2	.....	4	2	.....	.....	2	2.0
152	I	2	2	22	26	38	20	12	16	10	.....	2	.....	2	.....	.....	.....	.....	.....	1.33

TABLE IV

Showing Distribution of Points Read, Number Reproduced, and the Median by Different Schools

No. of Papers	No. of Depart-ments	0	5	10	15	20	25	30	35	40	45	50	Median
478	more than III	10	18	80	120	108	90	30	12	12	....	....	15.6
256	III	12	10	38	70	48	51	20	4	4	....	....	15.0
368	II	30	10	80	94	78	50	18	8	....	....	....	13.3
160	I	24	8	34	38	22	22	8	2	2	....	....	11.7

per cent. Thus there is good correlation, and the differences in the scores obtained should not be as great as is brought out in the medians for the number of points reproduced. It is evident from this that the rural schools do not do as efficient work in reading as do the San Jose schools.

DIFFERENT SCHOOLS COMPARED

Tables III and IV show that the smaller schools in the rural districts do the poorest work. The one- and the two-teacher schools fall considerably below the three- and the four-teacher schools, the three-teacher schools doing the best work, and the one-teacher schools the poorest. This seems to argue splendidly in favor of rural-school consolidation. The small schools are evidently at a great disadvantage. But why the schools which have more than three teachers, and which may be classed as village schools, should fall below the three-teacher rural schools is unexplainable.

CONCLUSION

The following facts are evident from this study:

1. The rural schools of this county fall below the standardized scores in reading, especially in the lower grades.
2. The rural schools in the county compare favorably with the city schools of San Jose in the rate of reading, but both fall below the standard.
3. The rural schools of the county fall below the San Jose schools in the number of points reproduced from the material read.
4. A great variation of ability is shown between individual pupils in every class and grade.
5. Progress from grade to grade is irregular, and even a very noticeable retardation occurs from the seventh to the eighth grade.
6. The one- and two-teacher schools do inferior work in reading, as compared with the larger schools, which are better organized.